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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,737	09/26/2001	Eric Levy-Abegnoli	FR920000040US1	9268

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EXAMINER

LIN, KELVIN Y

ART UNIT	PAPER NUMBER
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2142

DATE MAILED: 11/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/963,737

Applicant(s)

LEVY-ABEGNOLI ET AL.

Examiner

Kelvin Lin

Art Unit

2142

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## Detailed Action

### Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-20 are rejected under 35 USC 102(e) as being anticipated by Bruck et al., (U.S. Patent 6801949).
3. Regarding claim 1, Bruck teaches a method for enabling a front-end load balancing function to a cluster of servers functioning as an Internet site for serving end-users, said front-end load balancing function and said end-users establishing transmission control protocol (TCP) connections, said method comprising the steps of:
  - spreading said front-end load balancing function over more than one individual load balancer (ILB) (Bruck, col.2, l.38-46) ;
  - enabling each ILB to consistently self-assert, for said front-end load balancing function, an ILB owner for each one of said TCP connections (Bruck, col. 7, l.30-33);

- processing an ILB-owned TCP connection on behalf of said load balancing function in said each ILB, for each one of said TCP connections owned by each said ILB (Bruck, Fig.3); and
  - handing off an unassigned TCP connection to said ILB owner in each said ILB, for each one of said TCP connections not owned by each said ILB (Bruck, col.8, l.38-41).
4. Regarding claim 2, Bruck further discloses the method according to claim 1, wherein said enabling step further includes steps of:
- consistently self-asserting, for said front-end load balancing function, a back up ILB owner for each one of said TCP connections (Bruck, col.12, l.53-60); and
  - utilizing said back up ILB owner to process said ILB owned TCP connection should said ILB owner become incapable of processing said ILB owned TCP connection (Bruck, col. 12, l.60-62).
5. Regarding claim 3, Bruck further discloses the method according to claim 2, wherein said enabling step, further includes steps of:
- using a connection unique identifier for each one of said TCP connections (Bruck, col. 7, l.58-61) ;
  - using an ILB unique identifier for each said ILB (Bruck, Fig. 2, Fig.7, col.6, l.67);
  - computing a score for each said ILB (Bruck, col. 12, l.62-64);
  - obtaining a set of scores (Bruck, col.13, l.10-19);

- ranking said set of scores, said ranking step further includes (Bruck, col.12, l.63, "the preference is functioning as ranking that is for the better choice"):
  - designating said ILB having a best ranked score as said ILB owner (Bruck, col.13, Table 1);
  - designating said ILB having a second best ranked score as said back up ILB owner Bruck (Bruck, col.13, in Table 1, column of Persistence Flag)..
6. Regarding claim 4, Bruck further discloses the method according to claim 3, wherein said method further includes a step of : adding a connection unique identifier use step wherein said connection unique identifier is a twelve byte quadruplet including a TCP destination port, an IP destination address, a TCP source port, an IP source address (Bruck, col.11, l. 46-56).
7. Regarding claim 5, Bruck further discloses the method according to claim 4, wherein said method further includes a step of: using said ILB unique identifier wherein said ILB unique identifier is an IP address of said ILB (Bruck, col.7, l.59-63).
8. Regarding claim 6, Bruck further discloses the method according to claim 4, wherein said method further includes a step of: using said ILB unique identifier wherein said ILB unique identifier is an index which is unique within said front-end load balancing function (Bruck, col. 13, l.20-21).
9. Regarding claim 7, Bruck further discloses the method according to claim 3, wherein said ranking step further includes a step of: ranking on the basis of the

arithmetical values of said set of scores (Bruck, col.12, l.62-64, col. 13, Table 1, the column of "Persistence Flag value set to 0, 1, or 3").

10. Regarding claim 8, Bruck further discloses the method according to claim 3, wherein said designating steps further includes steps of: selecting the largest arithmetical value of said set of scores as said best ranked score; and selecting the second largest arithmetical value of said set of scores as said second best ranked score (Bruck, col. 13, l.26-32).
11. Regarding claim 9, Bruck further discloses the method according to claim 3, wherein said step of computing a score further includes a step of: calculating a cyclic redundancy check (CRC) code over said ILB unique identifier concatenated to said connection unique identifier (Bruck, col.9, l.17-22, "CRC is used to detect transmission error" and it is a well known skill in the TCP/IP area).
12. Regarding claim 10, Bruck further discloses the method according to claim 1, wherein said method further includes a step of: designating a particular server, out of said cluster of servers due to process each said ILB owned TCP connection, with a lookup table of owned connections (LTOC) included in each said ILB (Bruck, col. 14, l.47-54, " .. from the node map (worked as lookup table)..., it knows how many additional machines to expect in the cluster..").
13. Regarding claim 11, Bruck further discloses the method according to claim 10, wherein said method further includes a step of: including in each said LTOC, for each ILB owned TCP connection, said backup ILB owner (Bruck, col. 12, l.60-62).

14. Regarding claim 12, Bruck further discloses the method according to claim 1, wherein said method further includes a step of: including a cache of all least recently used associations formed, within said front-end load balancing function , between each one of said TCP connections with an individual server out of said cluster of servers, in each of said ILB (Bruck, col. 18, l.3-5, col.34, l.46-48).
15. Regarding claim 13, Bruck further discloses the method according to claim 3, upon receiving a TCP synchronous idle character (SYN) Packet in a receiving ILB, wherein said method further includes steps of: computing said set of scores; determining said ILB owner and said back up ILB owner; checking if said receiving ILB is said ILB owner; selecting an individual server to process a new TCP connection, in response to determining that said receiving ILB is said ILB owner; forwarding said TCP SYN packet to said individual server; broadcasting a control packet within said front-end load balancing function informing of a new formed association between said new TCP connection, said individual server and said back up ILB owner in all ILBs receiving said broadcast control packet; optionally caching said new formed association; testing if said broadcast receiving ILB is selected said backup ILB owner; moving forward directly to said completing step, in response to determining that said broadcast receiving ILB is not selected said backup ILB owner; storing in said LTOC of said broadcast receiving ILB that, for said new TCP connection, said broadcast receiving ILB is said back up ILB owner, in response to determining that said broadcast receiving ILB is selected said backup ILB owner; forwarding said TCP SYN packet to said

ILB owner, in response to determining that said receiving ILB is not said ILB owner; forwarding said TCP SYN packet to said individual server; broadcasting a control packet within said front-end load balancing function informing of a new formed association between said new TCP connection, said individual server and said back up ILB owner; in all ILBs receiving said broadcast control packet; optionally caching said new formed association; testing if said broadcast receiving ILB is selected said backup ILB owner; moving forward directly to said completing step, in response to determining that said broadcast receiving ILB is not selected said backup ILB owner; and storing in said LTOC of said broadcast receiving ILB that, for said new TCP connection, said broadcast receiving ILB is said back up ILB owner, in response to determining that said broadcast receiving ILB is selected said backup ILB owner (Bruck, col. 18, l.8-29, col. 27, l.23-67, col.28, l. 1-65 col.34, l.44-58).

16. Regarding claim 14, Bruck further discloses the method according to claim 3, Upon receiving a transmission control protocol (TCP) Packet other than a synchronous idle character (SYN), in said receiving individual load balancer (ILB), said method further comprising the steps of: computing said set of scores (Bruck, col.12, l.62-64) ; determining said ILB owner and said back up ILB owner (Bruck, col.12, l.59-60); checking if said receiving ILB is said ILB owner or said back up ILB owner of a previously established TCP connection (Bruck, col.12, l.57-59); retrieving in said LTOC of said receiving ILB a corresponding entry for said previously established TCP connection, in response to said



receiving ILB is said ILB owner or said backup ILB owner of a previously established TCP connection (Bruck, col.14, l.14-20); forwarding said TCP packet to said individual server according to said LTOC corresponding entry (Bruck,col.29, l.36-42); However, it failed to test if said TCP packet is a FIN or RST packet (see 35 USC 103(a) at next section); moving forward directly to said completing step, in response to determining that said TCP packet is not a FIN or RST packet; broadcasting an end of connection control packet within said front-end load balancing function informing all ILBs that said previously established TCP connection terminate (Bruck,col.27, l.33-39); thus, that each said cache and said LTOC of said back up ILB owner and/or said ILB owner must be updated accordingly in response to determining that said TCP packet is a FIN or RST packet (Bruck,col.27, l.40-45); looking up said cache of said receiving ILB for an entry corresponding to said previously established TCP connection, in response to determining that said receiving ILB is not said ILB owner nor said back up ILB owner of a previously established TCP connection (Bruck,col.28, l.30-33); forwarding said TCP packet to said individual server according to said LTOC corresponding entry, in response to finding an entry corresponding to said previously established TCP connection (Bruck,col.28, l.47-50); ; testing if said TCP packet is a FIN or RST packet; moving forward directly to said completing step, in response to determining that said TCP packet is not a FIN or RST packet; broadcasting an end of connection control packet within said front-end load

balancing function informing all ILBs that said previously established TCP connection has terminated (Bruck,col.29, l.39-42) thus, that each said cache and said LTOC of said back up ILB owner and/or said ILB owner must be updated accordingly (Bruck,col.29, l.12-20), in response to determining that said TCP packet is a FIN or RST packet; and forwarding said TCP packet to said ILB owner, in response to not finding an entry corresponding to said previously established TCP connection (Bruck,col.28, l.32-38).

17. Regarding claim 15, Bruck further discloses the method according to claim 14, wherein said method further comprising the step of: forwarding to said ILB owner said received packet other than a SYN when receiving ILB has no cache, in response to determining that said receiving ILB is not said ILB owner nor said backup ILB owner of a previously established TCP connection (Bruck,col.29, l.12-16).
18. Regarding claim 16, Bruck further discloses the method according to claim 1, wherein said method further comprising the step of: broadcasting ID messages regularly from each said ILB in order to keep all other said ILBs aware of their respective status while each said ILB actively participating, at any given instant, in said front-end load balancing function (Bruck, col. 3, l.41-59).
19. Regarding claim 17, Bruck further discloses the method according to claim 16, wherein upon listening for the reception of said ID messages, in said receiving ILB said method further comprising the steps of: checking if a new ILB has joined said front-end load balancing function, in response to receiving a new ID

message; continuing ID message monitoring, in response to determining that said new ILB has not joined said front-end load balancing function; recomputing scores including said new ILB, in response to determining that said new ILB has joined said front-end load balancing function for each one of said TCP connections currently handled by said receiving ILB as said ILB owner or as said backup owner; updating a transfer table, said updating step said transfer table further comprising: adding said ILB owned TCP connection in said transfer table as now owned by said new ILB, in response to determining if said new ILB is elected to become said ILB owner and said receiving ILB is elected to become said back up ILB owner; changing, in said LTOC of said receiving ILB, state of current TCP connection; adding said ILB owned TCP connection in said transfer table as now backup owned by said new ILB, in response to determining if said receiving ILB remains to be said ILB owner and said new ILB is elected to become said back up ILB owner; adding said ILB owned TCP connection in said transfer table as now back up owned by said new ILB, in response to determining said new ILB is elected to become said back up ILB owner and said receiving ILB is no longer said ILB owner or said back up ILB owner; deleting, in said LTOC of said receiving ILB, current TCP connection; and transferring said transfer table to said new ILB (Bruck, col.12, l. 45-64, col. 21, l.19-45).

20. Regarding claim 18, Bruck further discloses the method according to claim 17, wherein upon listening for the reception of said ID messages, in said receiving ILB, said method further comprising the steps of: checking if a former ILB has left

said front-end load balancing function, in response to receiving a new ID message; continuing ID message monitoring, in response to determining if a former ILB has not left said front-end load balancing function; flushing said cache of said receiving ILB of all entries corresponding to said former ILB, in response to determining if a former ILB has left said front-end load balancing function; updating said transfer table, for each one of said TCP connections currently handled by said receiving ILB as said ILB owner or as said back up ILB owner, said step of updating said transfer table further comprising the step of: re-computing a new back up ILB owner among remaining ILBs, in response to determining said receiving ILB is said ILB owner and said former ILB was said backup ILB owner; adding in said transfer table said new back up ILB owner; changing, in said LTOC of said receiving ILB, state of current TCP connection so as said receiving ILB becomes a new ILB owner, in response to determining said receiving ILB is said back up ILB owner and said former ILB was said ILB owner; re-computing a new back up ILB owner; adding in said transfer table said new ILB owner and said new back up ILB owner; transferring said transfer table to all remaining ILBs (Bruck, col.12, l.23-44, col. 16, l.6-16, col.17, l.31-47, col.26, l.20-24, col.28, l.3-24, col. 28, l.30-51, col.33, l.22-25, col.34, l.4-15).

21. Regarding claim 19, it has similar limitations as claims 1. Therefore, claim 19 is rejected under Bruck for the same reasons set forth in the rejection of claim 1.
22. Regarding claim 20, it has similar limitations as claims 1. Therefore, claim 20 is

rejected under Bruck for the same reasons set forth in the rejection of claim 1.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claims 14 is rejected under 35 U.S.C 103(a) as being unpatentable over Bruck in view of Albert et al., (US Patent 6775692).
24. Regarding claims 14, Bruck differs from the claimed invention in that it fails to indicate the testing of TCP packet is a FIN or RST packet, instead of stating " ... until it receives the SYN updates from the other distributed servers.. " (Bruck, col.29, l.14-16). However, Albert teaches how the service manager notify the receiving packet is FIN or FIN ACK (Albert , col.27, l.63), in addition, Albert also teaches the service manager also keep affinities long enough after an outbound FIN is detected. The testing FIN or RST packet is a well known skilled in the TCP/IP area. It is used for check if the connection is terminated or released. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Albert FIN packet checking scheme with Bruck's TCP/IP packet checking. And improves the connection establishing, initialization, and releasing/terminating efficiently.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to application's disclosure.

- Blumenau et al., (Patent No. 6260120) Storage Mapping And Partitioning Among Multiple Host Processors In The Presence Of Login State Changes And Host Controller Replacement.
- Kelly et al., (Patent No. 6441782) Method And System of Directing An Antenna In A Two-Way Satellite System.
- Nguyen et al., (PG Pub 20010043574) Transceiver In A Two-Way Satellite System.
- IEEE – Goldszmidt G. S. "Load Management For Scaling Up Internet Services", IEEE Network Operation and Management Symposium US New York, NY, IEEE vol. Conf. 10, pp. 828-835, Feb. 15, 1998.

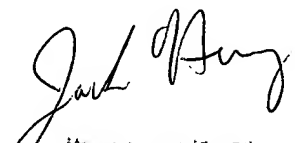
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelvin Lin whose telephone number is 571-272-3898. The examiner can normally be reached on Flexible 4/9/5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Harvey can be reached on 571-272-3896. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/19/04  
KYL

  
JASON D. HARVEY  
SUPERVISORY PATENT EXAMINER